

## **Dryden Flight Research Center**

The Dryden Flight Research Center, located at Edwards Air Force Base, California, is NASA's primary installation for flight research. Over the past 60 years, projects at Dryden have led to major advancements in the design and capabilities of many civilian and military aircraft. The Center is involved in the following:

- Support of operations for the Space Shuttle
- Development of future access-to-space vehicles
- Conduct of airborne science missions and flight operations
- Development of piloted and unmanned aircraft test beds for research and science missions

Range Safety operations at Dryden are managed by the Range Safety Office. Under an alliance agreement with the Air Force Flight Test Center, the Dryden Center Director established the Range Safety Office to provide independent review and oversight of range safety issues. The Range Safety Office also supports the Center by providing trained flight termination system engineers, Range Safety Risk Analysts, and Range Safety Officers to provide mission and project support. In addition, the office supports the NASA Range Safety Training Program by providing the unmanned aerial system perspective in the development of range safety courses.

### **Unmanned Aerial Systems and Vehicles**

Dryden continues to support the testing of a wide range of unmanned aerial systems and vehicles. The systems and vehicles flown with Dryden's assistance are described below.

#### **Model-Type Unmanned Aerial Systems**

The model-type unmanned aerial systems consist of tactical reconnaissance and surveillance vehicles. The primary purpose of the flights was to acceptance test the vehicles before delivery to the United States military. Dryden has supported over 340 hours of operations on six vehicles from three different companies.

#### **Blended Wing Body Low Speed Vehicle**

The blended wing body low speed vehicle unmanned aerial vehicle is a dynamically scaled version of the original concept vehicle. The primary goals of the test and research project for this vehicle are as follows:

- Study the flight and handling characteristics of the blended wind body design
- Match vehicle performance with engineering predictions based on computer and wind tunnel studies
- Develop and evaluate digital flight control algorithms
- Assess the integration of the propulsion system to the airframe

Industry studies suggest that because of its efficient configuration, the blended wing body would consume 20 percent less fuel than jetliners of today, while cruising at high subsonic speeds on flights of up to 7,000 nautical miles. To date, the project has conducted six successful flights.

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### Ikhana

NASA's Ikhana unmanned aerial vehicle is a General Atomics Predator-B modified to support the conduct of Earth science missions for the Science Mission Directorate. The aircraft is capable of mission durations in excess of 24 hours at altitudes above 40,000 feet. On-board support systems include a NASA developed airborne research test system.

The test system can host research flight control algorithms that can test autonomous sensor or autonomous aircraft control concepts. The aircraft is designed to be disassembled and transported in a large shipping container aboard standard military transports.



The vehicle has successfully flown multiple missions over the western United States in support of the National Interagency Fire Center. The flights reached as far north as Washington, Idaho, and Montana. Recently, the vehicle has flown multiple missions successfully over the Southern California wildfires, sending near real-time imagery to the firefighters.

The Range Safety Office has supported flight planning and risk analysis tasks in support of Federal Aviation Administration Certificate of Authorization applications as well as real-time operations support. The vehicle has flown seventeen flights this year with durations lasting as long as 14 hours.

### Orion

The Orion Project is part of NASA's Constellation Program. The Orion Project consists of the crew module (shown right) and launch abort system.

Dryden is tasked with conducting a series of flight tests to demonstrate proper operations of the launch abort system and the crew module recovery systems in response to abort events initiated on the launch pad and during the initial ascent phase of flight.

The abort flight tests will be conducted at the White Sands Missile Range in New Mexico.

